

Appln No. 09/370,601

Amdt date June 16, 2004

Reply to Office action of April 13, 2004

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Cancelled).

2. (Currently Amended) An irrigation ablation probe comprising:

an elongated probe body having a length between proximal and distal ends and comprising an elongated ablation electrode extending the length of the elongated probe body, wherein the elongated ablation electrode defines an inner cavity, the elongated ablation electrode having at least one irrigation opening through which fluid can pass from the inner cavity to the outside of the elongated ablation electrode, the ~~[elongated probe body]~~ ablation electrode being generally rigid from its proximal end to its distal end so that the ~~[body]~~ ablation electrode cannot bend during ablation, and wherein the elongated ablation electrode has an exposed distal portion that is generally straight and forms an angle  $\alpha$  greater than  $0^\circ$  with the remainder of the elongated probe body, the angle  $\alpha$  being preformed;

a sheath positioned on the elongated ablation electrode and configured to define the exposed distal portion, wherein the elongated ablation electrode has a length greater than a length of the sheath;

means for introducing fluid into the inner cavity; and



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a handle mounted at the proximal end of the elongated probe body, the handle comprising a housing having a generally open interior receiving a proximal end of the elongated ablation electrode[-];

wherein the elongated ablation electrode remains in a fixed position relative to the elongated probe body and the handle during operation of the probe.

3. (Cancelled).

4. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the means for introducing fluid comprises an infusion tube attached to the proximal end of the elongated ablation electrode.

5. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the elongated generally rigid probe body comprises a malleable material.

6. (Currently Amended) An irrigation ablation probe comprising:

an elongated probe body having a length between proximal and distal ends and comprising an elongated tubular ablation electrode extending the length of the elongated probe body, the elongated tubular ablation electrode having at least one irrigation opening through which fluid can pass to the outside of the elongated tubular ablation electrode, the elongated probe body being generally rigid from its proximal end to its distal



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end so that the body cannot bend during ablation, and wherein the elongated tubular ablation electrode is generally rigid and has an exposed distal portion is generally straight and forms an angle  $\alpha$  greater than  $0^\circ$  with the remainder of the elongated probe body, the angle  $\alpha$  being preformed;

a non-conductive sheath positioned on the elongated tubular ablation electrode and configured to define the exposed distal portion, wherein the elongated ablation electrode has a length greater than a length of the sheath;

a handle mounted to the proximal end of the elongated probe body, the handle comprising a housing having a generally open interior receiving a proximal end of the elongated ablation electrode; and

an infusion tube having proximal and distal ends and extending through the elongated probe body for introducing fluid into the elongated tubular ablation electrode, the distal end of the infusion tube being attached to the elongated tubular ablation electrode[-];

wherein the elongated ablation electrode remains in a fixed position relative to the elongated probe body and the handle during operation of the probe.

7. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode forms the infusion tube.



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8. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode is made of stainless steel.

9. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode has an inner diameter ranging from about 0.40 inch to about 0.80 inch and an outer diameter ranging from about 0.50 inch to about 0.90 inch.

10. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode has an outer diameter ranging from about 0.50 inch to about 0.70 inch.

11. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode has an inner diameter ranging from about 0.40 inch to about 0.60 inch.

12. (Cancelled).

13. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated tubular ablation electrode is made of a malleable material.



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14. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the proximal end of the elongated tubular ablation electrode is mounted in the handle.

15. (Previously Presented) An irrigation ablation probe according to claim 6, further comprising a flexible plastic tubing attached to the proximal end of the elongated tubular ablation electrode for introducing fluid into the elongated tubular ablation electrode.

16. (Previously Presented) An irrigation ablation probe according to claim 15, wherein the flexible plastic tubing is attached to the proximal end of the elongated tubular ablation electrode within the handle.

17. (Cancelled).

18. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the at least one irrigation opening is located in the exposed distal portion of the elongated tubular ablation electrode to be in contact with the tissue to be ablated.

19. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated probe body has a length ranging from about 3.5 inches to about 12 inches.



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20. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated probe body has a length ranging from about 5 inches to about 10 inches.

21. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the elongated probe body has a length ranging from about 7 inches to about 8 inches.

22. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the exposed portion of the elongated tubular ablation electrode has a length ranging from about 0.50 inch to about 1.5 inches.

23. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the exposed portion of the elongated tubular ablation electrode has a length ranging from about 0.75 inch to about 1.25 inches.

24. (Withdrawn) An irrigation ablation probe according to claim 6, wherein the generally rigid probe body comprises:

tubing having proximal and distal ends and at least one lumen extending therethrough, wherein the ablation electrode is mounted at the distal end of the tubing; and

a stiffening wire extending through one of the at least one lumens of the tubing.

25. (Withdrawn) An irrigation ablation probe according to claim 24, wherein the infusion tube extends through one of the



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at least one lumen of the tubing, and wherein the distal end of the infusion tube is in fluid communication with at least one irrigation opening in the ablation electrode.

26. (Withdrawn) An irrigation ablation probe according to claim 6, wherein the generally rigid probe body comprises:

tubing having proximal and distal ends and at least one lumen extending therethrough; wherein the ablation electrode is mounted at the distal end of the tubing;

wherein the infusion tube extends through one of the at least one lumens of the tubing, and wherein the distal end of the infusion tube is in fluid communication with the at least one irrigation opening in the ablation electrode; and

a stiffening wire extending through one of the at least one lumens of the tubing.

27. (Withdrawn) An irrigation probe according to claim 26, wherein the probe body has a length ranging from about 3.5 inches to about 12 inches.

28. (Withdrawn) An irrigation probe according to claim 26, wherein the probe body has a length ranging from about 5 inches to about 10 inches.

29. (Withdrawn) An irrigation probe according to claim 26, wherein the probe body has a length ranging from about 7 inches to about 8 inches.



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30. (Withdrawn) An irrigation ablation probe according to claim 6, wherein the generally rigid probe body comprises:

tubing having proximal and distal ends and first and second lumens extending therethrough; wherein the ablation electrode is mounted at the distal end of the tubing;

wherein the infusion tube extends through the first lumen of the tubing, and wherein the distal end of the infusion tube is in fluid communication with the at least one irrigation opening in the ablation electrode; and

a stiffening wire having proximal and distal ends that extends through the second lumen of the tubing.

31. (Withdrawn) An irrigation probe according to claim 30, wherein the stiffening wire is made of stainless steel.

32. (Withdrawn) An irrigation ablation probe according to claim 30, wherein the stiffening wire is made of a malleable material.

33. (Withdrawn) An irrigation ablation probe according to claim 30, wherein the at least one irrigation opening comprises a longitudinal passage extending out the distal end of the tip electrode.

34. (Withdrawn) An irrigation ablation probe according to claim 30, wherein the at least on irrigation opening comprises at least one transverse passage.



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35. (Withdrawn) An irrigation ablation probe according to claim 30, wherein the tip electrode is porous.

36. (Withdrawn) An irrigation ablation probe according to claim 30, further comprising a temperature sensing means mounted in a blind hole in the tip electrode.

37. (Withdrawn) An irrigation probe according to claim 30, wherein the probe body has a length ranging from about 3.5 inches to about 12 inches.

38. (Withdrawn) An irrigation probe according to claim 30, wherein the probe body has a length ranging from about 5 inches to about 10 inches.

39. (Withdrawn) An irrigation probe according to claim 30, wherein the probe body has a length ranging from about 7 inches to about 8 inches.

40. (Cancelled).

41. (Withdrawn) A method for treating atrial fibrillation in a patient comprising:

opening the heart of the patient; and ablating at least one linear lesion in the heart tissue using an irrigation probe as recited in claim 2.



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42. (Withdrawn) An irrigation ablation probe according to claim 2, wherein the means for introducing fluid into the inner cavity comprises an infusion tube having proximal and distal ends and extending through the probe body.

43. (Withdrawn) An irrigation probe according to claim 42, wherein the infusion tube and the ablation electrode together comprises a single generally hollow body.

44. (Withdrawn) An irrigation probe according to claim 6, wherein the infusion tube and the ablation electrode together comprise a single generally hollow body.

45. (Withdrawn) A method for treating atrial fibrillation in a patient comprising:

opening the heart of the patient; and

ablating at least one linear lesion in the heart tissue using an irrigation probe as recited in claim 6.

46. (Withdrawn) A method for treating atrial fibrillation in a patient comprising:

opening the heart of the patient; and

ablating at least one linear lesion in the heart tissue using an irrigation probe as recited in claim 26.

47. (Withdrawn) A method for treating atrial fibrillation in a patient comprising:

opening the heart of the patient; and



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ablating at least one linear lesion in the heart tissue using an irrigation probe as recited in claim 44.

48. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the exposed distal portion of the elongated ablation electrode is conductive around a full circumference of the exposed distal portion.

49. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the exposed distal portion of the elongated tubular ablation electrode is conductive around a full circumference of the exposed portion.

50. (Cancelled).

51. (Previously Presented) An irrigation ablation probe according to claim 48, wherein substantially the entire exposed distal portion of the elongated ablation electrode is conductive.

52. (Previously Presented) An irrigation ablation probe according to claim 49, wherein substantially the entire exposed portion of the elongated tubular ablation electrode is conductive.

53. (Cancelled).



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54. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the angle  $\alpha$  ranges from greater than  $0^\circ$  to about  $270^\circ$ .

55. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the angle  $\alpha$  ranges from about  $60^\circ$  to about  $140^\circ$ .

56. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the angle  $\alpha$  is about  $90^\circ$ .

57. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the angle  $\alpha$  ranges from greater than  $0^\circ$  to about  $270^\circ$ .

58. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the angle  $\alpha$  ranges from about  $60^\circ$  to about  $140^\circ$ .

59. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the angle  $\alpha$  is about  $90^\circ$ .

60. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the at least one irrigation opening is located in the exposed distal portion of the elongated ablation electrode to be in contact with the tissue to be ablated.



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61. (Previously Presented) An irrigation ablation probe according to claim 2, wherein a plurality of irrigation openings are located in the exposed distal portion of the elongated ablation electrode to be in contact with the tissue to be ablated.

62. (Previously Presented) An irrigation ablation probe according to claim 2, wherein the infusion tube and the elongated ablation electrode comprise a single generally hollow body.

63. (Previously Presented) An irrigation ablation probe according to claim 6, wherein the infusion tube and the elongated tubular ablation electrode comprise a single generally hollow body.